

A NEW SPECIES OF *BRAZORIA* (LAMIACEAE)
FROM THE CENTRAL MINERAL REGION OF TEXAS

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ABSTRACT

Brazoria enquistii M.W. Turner sp. nov. from the central mineral region of Texas (Mason, Llano and Burnet counties) is described. It is similar to *B. truncata* (Benth.) Engelm. & A. Gray from which it differs in having longer floral bracts with more pronounced ciliation, shorter internodes, and distinctions in the lobes of the calyx. Its habitat and edaphic preferences, unique to the genus, are also discussed. Descriptions, photographs, dot-maps, and keys to species are presented.

RESUMEN

Se describe *Brazoria enquistii* M.W. Turner sp. nov. de la región mineral central de Texas (condados de Mason, Llano y Burnet). Se asemeja a *B. truncata* (Benth.) Engelm. & A. Gray de la que se distingue por tener las brácteas florales más largas con ciliación más destacada, los entrenudos más cortos, y unas distinciones en los lóbulos del cáliz. Su hábitat y preferencias edáficas, únicos en el género, también se discuten. Se ofrecen descripciones, fotos, mapas de distribución, y clave de especies.

As noted previously in my overview of the genus (Turner 1996), the only three collections of *Brazoria* that were known to me from the central mineral region of Texas prior to 1996 (from collections housed at BRIT, GH, K, LL, OKL, TAES, TEX) possibly constituted an undescribed taxon, but lack of extant populations precluded their recognition. Subsequently, sightings of populations of the taxon by Marshall Enquist in this region prompted three years of additional fieldwork by myself. These studies have convinced me that the plant is undescribed and is deserving of specific recognition.

TAXONOMY

Brazoria enquistii M.W. Turner, sp. nov. (**Figs. 1, 2 & 3**). TYPE: U.S.A. TEXAS: Mason Co.: ca. 11 airline mi ESE of Mason, off Lower Willow Creek Rd at crossing of Willow Creek, 4 mi E of US Hwy 87, 11 May 1996, M.W. Turner 64 (HOLOTYPE: TEX; ISOTYPES: BRIT, GH, MO, TAES, US).

Brazoriae truncatae (Benth.) Engelm. & A. Gray var. *truncatae* similis sed racemis compactissimis cum internodis 2.5–4.0 m; bracteis floralibus 8–12 mm, cum ciliis 2–3 mm; lobis inferioribus calycum leniter apiculatis, plerumque habentibus unum “dentem” per lobum. Plantae indesscriptae conservandae sunt.

Erect annual herbs mostly 15–40 cm high, simple, or branched at base; if latter, branches immediately ascending from base. **Stems** square, pubescent below

inflorescence on all sides. **Leaves** opposite; lower leaves, if persistent, usually oblanceolate (occasionally spatulate), 5–9 cm long, 1–2 cm wide, often tapering to a long-winged petiole; margins undulate to denticulate; upper leaves oblong to elliptic, denticulate, usually sessile and partly clasping. Mature **spikes** racemoid, densely flowered, with lower internodes mostly 2.5–4.0 mm long; flowers decussate. **Bracts** at base of pedicels mostly ovate-orbicular, 8–12 mm long; margins ciliate, with hairs mostly 2–3 mm in length. **Calyces** broadly campanulate, 5–8(–10) mm long, bilabiate; the two lower lobes mostly truncate with one “tooth,” woolly-tomentose at base, with many eglandular hairs reaching 2 mm in length; upper middle lobe usually truncate or shallowly mucronate; upper lateral lobes mucronate to apiculate; capitate-glandular hairs scattered over both lower and upper lobes. **Corollas** 15–25 mm long, bilabiate, pale lavender and usually distinctly veined, sparsely puberulent along the upper surface; upper lip bifid; lower lip trifid, lobes usually emarginate; throats with annulus usually perpendicular to axis of corolla 2–3 mm above ovary, maculate, with distinct hump on lower surface beneath stamens. **Stamens** 4, fertile, the anterior pair longer than the posterior. **Filaments** ca. 1 mm wide at base of free portion, conspicuously winged, villous, arched inward near apices; upper pair free from adnation to corolla for 3–4 mm; lower, innermost pair free for 1.0–1.5 mm, with mutually opposing “bulges” or “shoulders” that, together with overlapping hairs, hold style in epipetalous position. **Thecae** apiculate laterally at base, dark purple and ringed with white; upper pair slightly smaller than lower (ca. 1.2 mm vs 2.0 mm); ventral (rarely dorsal) surface of connective tissue between thecae usually with several to many white hairs. **Styles** 1.0–1.5 mm long, bilobed, glabrous; branches linear-lanceolate. **Nutlets** mostly 1.5–2.5(–3.5) mm long, strongly trigonal, with incurved hispidulous hairs, rarely glabrous.

Distribution.—The most geographically isolated species of the genus, *Brazoria enquistii* is known only from three counties—Burnet, Llano, and Mason (**Fig. 1**)—and I have only been able to locate extant populations in the latter two of these. Many attempts to ascertain distribution extensions (beyond what is reported here) have been made in the surrounding vicinity over the past five years to no avail. Although only ca. 130 km separates the taxon (Llano/Burnet Co. border area) from the nearest populations of *B. truncata* (Bastrop Co.) (**Fig. 2**), the intervening distance presents the sand-loving genus with a barrier of limestone, the central mineral region being renowned as a granitic outcrop (which weathers to sand) surrounded by calcareous soils. This geographic isolation, together with its infrequent occurrence and short blooming period, have kept the taxon in relative obscurity.

Habitat.—*Brazoria enquistii*, unlike the eastern species of the genus which tend to prefer the loose white sands of xeric slopes, grows almost exclusively along granitic streambeds of the Llano River watershed. Only four of the 16 populations discovered by the author (sites of *Turner* 71, 72, 95 and 96) are not

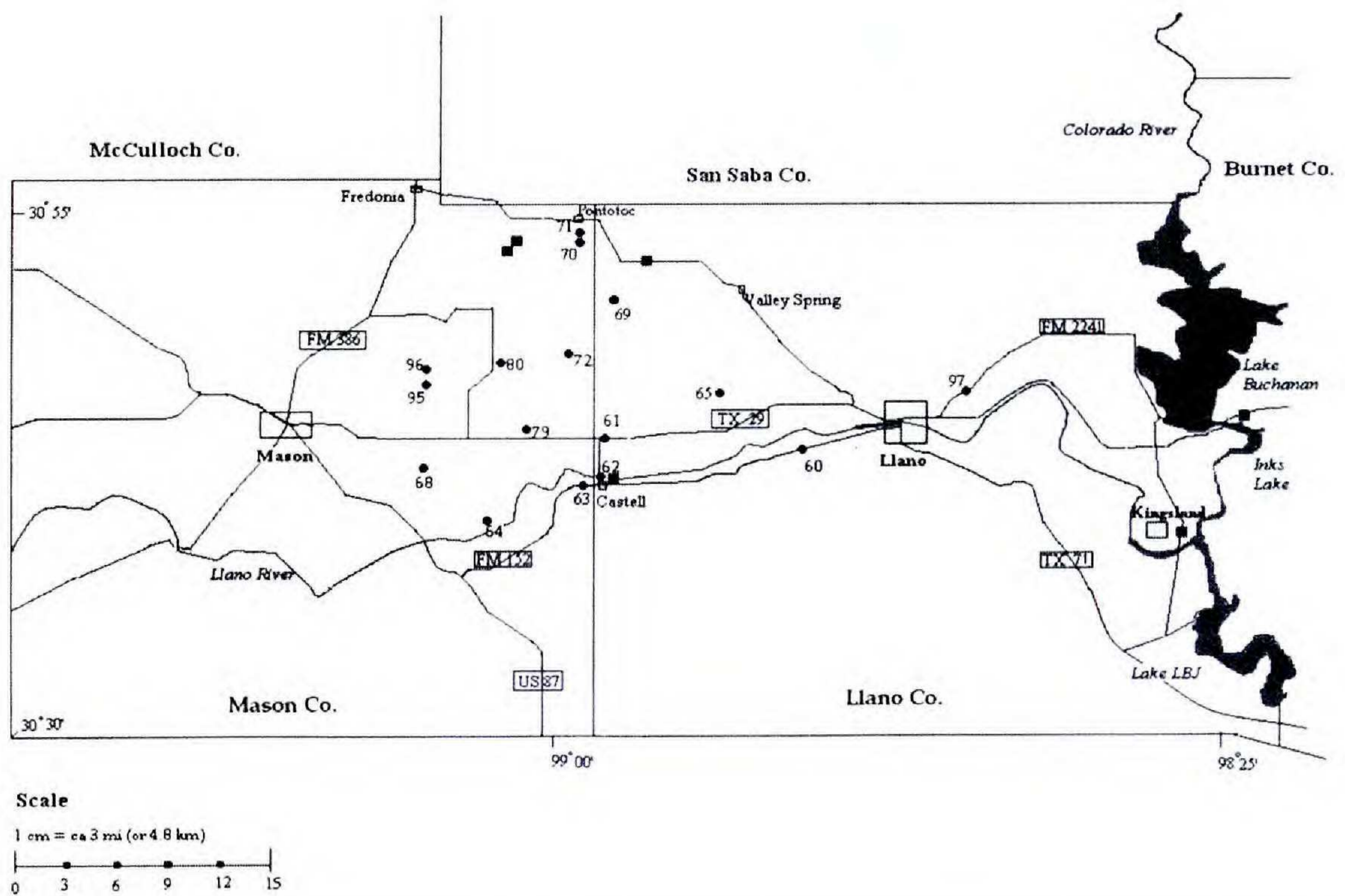


FIG. 1. Documented distribution of *Brazoria enquistii* in three counties of central Texas. Closed circles represent specimens collected by author; numbers refer to collection numbers cited. Closed squares represent other documented collections known to date and cited herein.

along such streambeds (but even two of these are within 100 m of one). More specifically, the species is rarely found near the water's edge, but rather occurs on the raised, sparsely-vegetated sand embankments within 10–20 m of adjacent streams. The species seems to prefer embankments along permanent water, and is only rarely found in dry washes and gullies. One of the largest populations (estimated at 10,000+ individuals at the type locality) was discovered on a large, flat, sand island in the middle of Willow Creek as it approaches the Llano River. Indeed, the species seems to flourish in creek beds as they widen downstream near their mouths (presumably because the waterways accumulate more sand), and becomes less abundant upstream as the creeks become narrower. Only three of the 22 sites known to date (both historical and extant) lie south of the Llano River.

Phenology.—All known collections are from the month of May.

Remarks.—*Brazoria enquistii* most closely resembles *B. truncata* var. *truncata*. The most obvious distinguishing character of the taxon is its long and well-developed bracts (see Fig. 3 and key following), which almost conceal the developing buds, in stark contrast to the shorter bracts of *B. truncata* whose buds, left exposed to view, display themselves in the compact rows that have earned that species the common name of “rattlesnake flower.” Another obvious character is the internode length which is the smallest of the genus (2–4

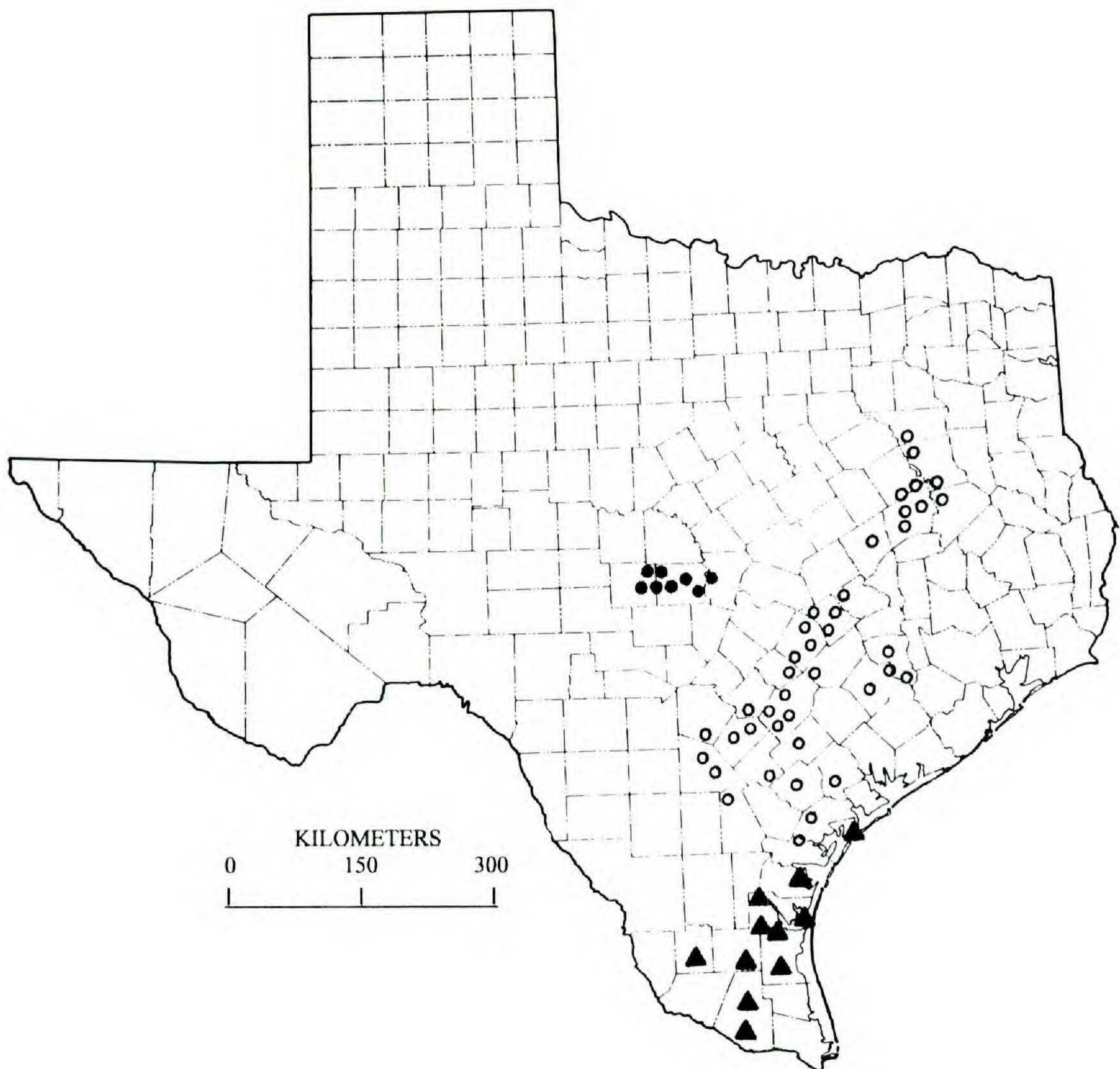


FIG. 2. Distribution of *Brazoria* species (varieties not shown). *B. arenaria* (closed triangles); *B. truncata* (open circles); *B. enquistii* (closed circles).

mm vs. 5–6 mm for *B. truncata* var. *truncata*, 8–13 mm for *B. t.* var. *pulcherrima* (Lundell) M.W. Turner, and 8–20(–30) for *B. arenaria* Lundell) and provides for an extremely compact spike.

Less obvious characters distinguishing the taxon from *B. truncata* include a longer bract ciliation (2–3 mm vs. 1–2 mm), a distinct shape to the lower lobes of the calyx (truncate or with only 1 “tooth” vs. with 3–5 “teeth”), and a subtle difference in the shape of the upper middle lobe of the calyx (truncate to shallowly mucronate vs. mucronate to apiculate).

So far as known, the first recorded collection of the taxon was made in 1910 in Kingsland (Llano Co.), *Hastings s.n.* (LL). Some 20 years later, the second recorded collection is from an area six miles northwest of Valley Spring in Llano Co., *Bauman’s* [sic] 6286 (TAES). Some 30 years elapsed before the third collection was made (in 1962 in Inks Lake State Park, Burnet Co., along Clear Creek,



FIG. 3. Three comparative stages of inflorescence development in two species of *Brazoria*. Top row, **A–C**: *Brazoria enquistii*. **A**, budding inflorescence with long floral bracts (lower bracts here at the upper limit of bract range, ca. 12 mm); **B**, early stages of flowering, bracts subtending the buds; **C**, mature flower with tightly compressed calyces due to short internodes. Bottom row, **D–F**: *Brazoria truncata* var. *truncata*. **D**, short floral bracts hidden (cf. “rattlesnake flower,” the common name for this species); **E**, bracts do not (or rarely) subtend buds; **F**, internodes longer, calyces not compressed.

Correll & Ogden 25300 (LL)). An extant population has been found at a location approximating the second collection (*Turner 69*); however, the author's repeated attempts at locating living populations in the Kingsland area and in western Burnet Co. have been unsuccessful. The Kingsland area may have become overdeveloped and/or the damming of the Colorado River for Lake LBJ (in 1951 with the Alvin Wirtz Dam) may have influenced the habitat. Repeated visits to Inks Lake State Park, with special attention to Clear Creek and Spring Creek, have likewise revealed nothing. A 1996 sighting by Marshall Enquist from the Llano/Burnet Co. line area (near Buchanan Dam), prompted this investigation, but local roadwork, immediately thereafter, completely altered the site and no further sightings have been made in the area to date. At the present, the western edge of Burnet Co. represents the eastern limit for the species.

Brazoria enquistii is the most geographically restricted taxon of the genus, distributed primarily within just two counties. Like *B. truncata* var. *pulcherrima*, which is restricted to about five counties in northeastern Texas (*Turner 1996*), *B. enquistii* can be locally abundant, which would likely preclude it from endangered species status. On the other hand, it is more infrequent in occurrence, tending to appear in isolated patches (due to its specialized habitat), rather than being loosely scattered along the roadside. The number of individuals at a given location can vary sharply from year to year: the type locality mentioned above contained over 10,000 plants in 1996, but only about 1% of that number in 1999.

Choice of rank.—The taxon is here treated at specific rank for the following reasons: it exhibits several distinguishing morphological characters (outlined above); it has a habitat and edaphic preference distinct from the other taxa of the genus (raised embankments of streambeds in purely granitic sand vs. xeric slopes of loose, white, non-granitic sands in open woodlands and stabilized dunes); it is geographically and edaphically isolated by the surrounding calcareous soil, which erects a barrier to gene exchange; and no populations intermediate to its related taxa have been discovered.

Etymology.—The species is named for Marshall Enquist, an attorney in the Austin area, who called to my attention extant populations in the central mineral region, without which this paper would not have been possible. Mr. Enquist's excellent floristic guide (*Enquist 1987*), as well as his active research on native Texas flora (including *Anemone*, *Crataegus*, *Desmodium*, and *Prunus*), have been an inspiration to botanists and naturalists alike.

Specimens examined: **U.S.A. Texas. Burnet Co.:** Inks Lake State Park along Clear Creek, 18 May 1962, *Correll & Ogden 25300* (LL). **Llano Co.:** Kingsland, 12 May 1910, *Hastings s.n.* (LL); 6 mi NW of Valley Spring, 8 May 1933, *Bauman's*[sic]6286 (TAES); ca. 6 mi WSW of Llano on FM 152 at Six Mile Creek, 11 May 1996, *Turner 60* (TEX); ca. 18 mi due W of Llano on TX 29 in Weide Creek, 14 May 1996, *Turner 61* (TEX); Castell, 19 May 1991, *Enquist 1934* (TEX); In Castell at Llano River crossing on FM 2768, 14 May 1996, *Turner 62* (TEX); ca. 6 airline mi due W of Valley Spring, on CR 405, 2.1 mi S of TX 71 at San

Fernando Creek crossing, 18 May 1997, *Turner 69* (TEX); ca. 2.5 mi E of Llano, on FM 2241, 1.5 mi NE of jct TX 29, along Wrights Creek, 16 May 1999, *Turner & Robbins 97* (TEX). **Mason Co.:** ca. 0.5 mi W of Castell on TX 152 in creek bed, 14 May 1996, *Turner 63* (TEX); ca. 11 airline mi W of Llano, off CR 404 at San Fernando Creek crossing, 19 May 1996, *Turner 65* (TEX); ca. 7 airline mi ESE of Mason, off Art Hedwigs Hill Rd, 3 mi N of US Hwy 87 & 1.6 mi S of TX 29 along Willow Creek, 18 May 1997, *Turner 68* (TEX); 2.7 mi S of Pontotoc (jct TX 71) on Hickory Grove Rd, along San Fernando Creek, 18 May 1997, *Turner 70* (TEX); 2.2 mi S of Pontotoc (jct TX 71) on Hickory Grove Rd, 18 May 1997, *Turner 71* (TEX); Hillis Fly Gap Ranch, 2.5 mi W of Pontotoc on TX 71, then 3.1 mi S on Fly Gap Rd, then 0.2 mi W to entrance, 12 May 2002, *Hillis 286* (TEX); 2.0 mi S of TX 71 on Fly Gap Rd at creek crossing, 18 May 2002, *Hillis 293* (TEX); ca. 14 airline mi ENE of Mason on Hickory Grove Rd, 2.5 mi N of jct with Union Rd, 18 May 1997, *Turner 72* (TEX); ca. 12 mi due E of Mason on Union Rd, 0.6 mi N of TX 29 at crossing of Martin Creek, 10 May 1998, *Turner 79* (TEX); ca. 11 airline mi ENE of Mason, on Eaton Cemetery Rd, 1 mi E of FM 1900 at crossing of Martin Creek, 10 May 1998, *Turner 80* (TEX); ca. 8 mi ENE Mason, on N Art Rd, 2.4 mi N of jct TX 29, 75 m N of creek (branch of E Willow Creek), 16 May 1999, *Turner & Robbins 95* (TEX); ca. 8 mi ENE Mason, on N Art Rd, 2.8 mi N of jct TX 29, 16 May 1999, *Turner & Robbins 96* (TEX).

A REVISED KEY TO THE SPECIES OF BRAZORIA

1. Floral bracts ciliolate, with hairs 0.1–0.2 mm in length; mature plants often basally branched with branches recumbant at base; basal leaves usually persistent, oblanceolate to spatulate; southern Texas _____ **B. arenaria**
1. Floral bracts ciliate, with hairs 1–3 mm in length; mature plants often not basally branched, or, if so, with branches immediately ascending from base; basal leaves rarely persistent, usually oblong to oblong-ob lanceolate; central, and southcentral to northeastern Texas.
 2. Floral bracts at base of pedicels mostly 8–12 mm in length; mature spikes very densely flowered, with lower internodes mostly 2.5–4.0 mm long; lower lobes of calyces shallowly apiculate with mostly one “tooth” per lobe; central mineral region (Burnet, Llano, Mason Co.) _____ **B. enquistii**
 2. Floral bracts at base of pedicels mostly 4–8(–9) mm in length; mature spikes less densely flowered, with lower internodes mostly 5–13 mm long; lower lobes of calyces dentate with mostly 3–5 “teeth” per lobe; not in central mineral region _____ **B. truncata**

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REFERENCES

- ENQUIST, M. 1987. Wildflowers of the Texas hill country. Lone Star Botanical, Austin, TX.
- TURNER, M.W. 1996. Systematic study of the genus *Brazoria* (Lamiaceae), and *Warnockia* (Lamiaceae), a new genus from Texas. *Pl. Syst. Evol.* 203:65–82.